J Ped Surg Case Reports 3 (2015) 158–159

Contents lists available at ScienceDirect

Journal of Pediatric Surgery CASE REPORTS

journal homepage: www.jpscasereports.com

Infantile perforated appendicitis: A forgotten diagnosis

Katherine W. Gonzalez*, Jeffrey J. Dehmer, Richard J. Hendrickson

Department of Pediatric Surgery, Children's Mercy Hospital, 2401 Gillham Road, Kansas City, MO 64108, USA

ARTICLE INFO

Article history:
Received 16 December 2014
Received in revised form
17 February 2015
Accepted 28 February 2015

Key words:
Infant
Appendicitis
Perforated

ABSTRACT

Acute appendicitis in the infant is a rare surgical diagnosis despite its frequency in older patients. The clinical presentation is often vague and can be misleading. We present the successful diagnosis and treatment of a 3 month old female with perforated appendicitis.

Acute appendicitis is one of the most common surgical diagnoses in the pediatric population. Diagnostic accuracy approaches 90% based on clinical presentation alone. However, neonates and infants with appendicitis more often have a variable course, and appendicitis is less often considered in the initial differential diagnoses [1]. We describe a 3 month old female who presented with abdominal pain and was found to have both acute perforated appendicitis and bacteremia.

1. Case report

This 3 month female was born full term via vaginal delivery without perinatal complications. She presented with a 12 hour history of irritability, nonbilious emesis and abdominal tenderness. Emesis had resulted in decreased oral intake and oliguria, prompting the patient's mother to bring her to the Emergency Department. Upon arrival, the patient was febrile to 39.5 and tachycardic (>210). Physical examination revealed a distended abdomen, diffuse tenderness and guarding. White blood cell count was normal (9.7×10^3/mL), without left shift or bandemia. Electrolytes were within normal limits. Abdominal ultrasound demonstrated a dilated non-compressible appendix measuring 1.1 cm in diameter. The appendix was filled with echogenic debris and had mild hyperemia. No appendicolith was seen.

Pre-operatively, she received multiple crystalloid fluid boluses (50 mL/kg total), was started on maintenance fluids, and given intravenous ceftriaxone (50 mg/kg) and metronidazole (30 mg/kg).

We performed a standard laparoscopic appendectomy. A vertical umbilical incision was made and a 5 mm STEP trocar placed (Covidien, Mansfield, MA). Laparoscopic inspection of the abdomen revealed gross purulence and matted small bowel in the right lower quadrant (Fig. 1). Two 3 mm stab incisions were placed in the left lower quadrant and lower midline. The perforated appendix was mobilized bluntly but unable to reach the umbilicus for extracorporeal appendectomy. Therefore the umbilical port was upsized to 12 mm and the left lower quadrant port to 5 mm. The appendix and mesentery were divided using a laparoscopic stapler. The appendix was removed via the umbilicus and the pelvis was suctioned clear of purulent fluid prior to fascial closure.

Postoperatively, the patient was started on peripheral parenteral nutrition while awaiting return of bowel function. On post-operative day 2, she was started on clear liquids with return of bowel function. When she was tolerating goal formula, the parenteral nutrition was discontinued. Blood cultures from the day of admission returned positive for *Streptococcus salivarius, Streptococcus parasanguinous*, and *Rothia mucilaginosa*. Infectious disease consultation was requested and the patient was placed back on ceftriaxone and metronidazole until repeat cultures returned negative. She received IV treatment for 1 week, and was discharged home with cefixime (8 mg/kg/day divided twice daily) for seven days.

The patient was seen back in the surgical and infectious disease clinics as an outpatient. She continued to recover well and no

* Corresponding author. Tel.: +1 816 234 3575; fax: +1 816 983 6885.
E-mail address: kwgonzalez@cmh.edu (K.W. Gonzalez).

http://dx.doi.org/10.1016/j.epsc.2015.02.014

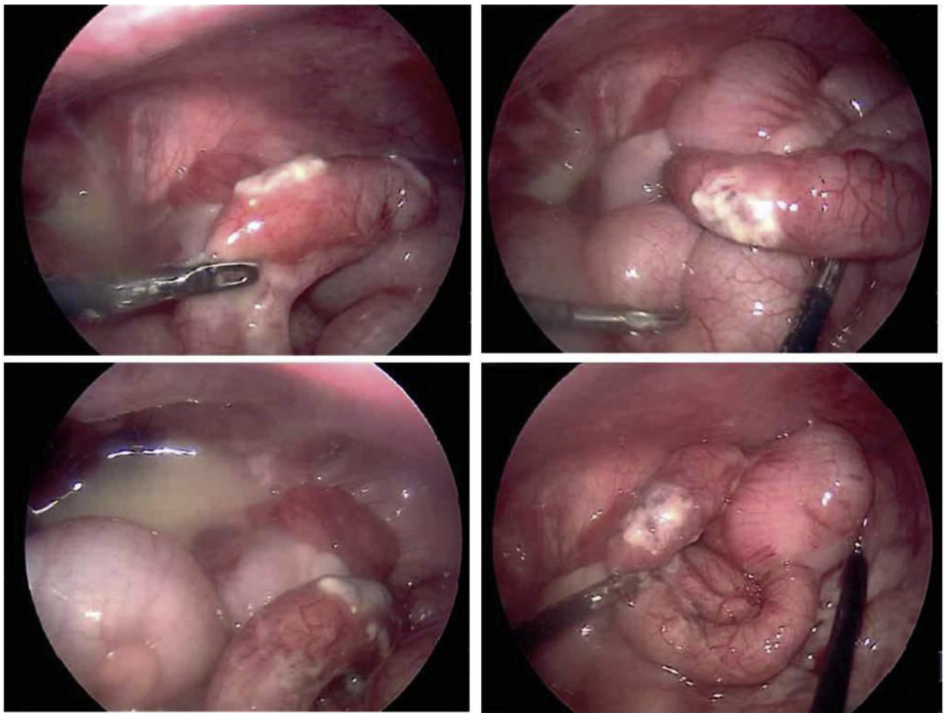

Fig. 1. Intraoperative photographs of infantile appendicitis.

further studies were necessary. Final pathology confirmed acute perforated appendicitis with serositis.

2. Discussion

Despite the frequency of acute appendicitis, only 2% of cases are reported in children less than 2 years. These children are nearly 3 times as likely to have perforation at the time of diagnosis compared to adults [2]. Presenting symptoms include feeding intolerance, emesis, fever, abdominal distension, and signs of sepsis. In neonatal patients, abdominal distension is the most common finding. Plain films alone are often not helpful unless pneumoperitoneum is present [3], although even then perforated appendicitis is not the clear culprit. Even with the diagnosis of appendicitis, further investigation must be taken to rule out Hirschsprung's disease, cystic fibrosis and necrotizing enterocolitis [4].

Multiple factors have been proposed to explain the decreased incidence of appendicitis in this age group. Infants have a wider based appendix which may lead to decreased rates of luminal obstruction [5]. They also spend a large portion of the day in the recumbent position. Most infants consume a diet of soft consistency foods or liquid. And finally they often have less frequent infections which may lead to less inflammation of peri-appendiceal lymphoid tissue [6].

Laparoscopy is increasingly more accepted for appendectomy in both the neonatal and infant population. A recent KID database analysis of patients less than 5 years found an increase in the laparoscopic approach both in adult and dedicated pediatric facilities from 11.4 to 31.3% between 2000 and 2006. Patients who underwent a laparoscopic appendectomy for perforated appendicitis had a decrease in complications by almost 5% and shorter hospital stay [7].

Perforated appendicitis in neonates and young children has been associated with higher morbidity and mortality. This has been attributed to the delay in diagnosis [5,6]. Although rare, appendicitis should remain on the differential diagnosis in infants with abdominal pain, emesis or signs of sepsis. Prompt surgical intervention is warranted.

3. Conclusion

Infantile appendicitis has a variable course and presentation. Although rare in this age group, appendicitis should remain on the differential diagnoses and spur timely operative intervention when indicated.

Conflicts of interest

None.

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